MEDICINE

Radioisotopes Cancer Aid

Iodine, gold and cobalt, made radioactive, hold the greatest hope in the fight against cancer. At present, this form of treatment is still in its early stages.

➤ EXPLODING ATOMS are among science's greatest hopes today in the fight against cancer.

Just as radium and the surgeon's knife can be used to destroy some malignant tissue that is cancer, so radioactive elements resulting from the processes of the atomic bomb can be used to wipe out some malignant growths.

Iodine, gold and cobalt in radioactive forms are the most promising of the potential anti-cancer radioisotopes.

No scientist would be foolhardy enough —or cruel enough to cancer victims—to hold out too much hope in individual cases. Nevertheless, the years of human life to be saved by future applications of radioisotopes promise to compensate many times over the loss of human life due to use of the atomic bomb in warfare—if the world can arrange not to use the atomic bomb as a weapon in the future.

When the cancer is in the thyroid gland, radioiodine is used as a means of diagnosis and often as treatment. The thyroid gland picks up and utilizes nearly all of the iodine in the human system, normally about 80 times as much as any other tissue.

When the uranium atom splits up—fission, it is called—as it does in the atomic bomb and in the more peaceful chain-reacting uranium pile, one of the many elements formed is a special kind of iodine with a weight 131 times the mass of the hydrogen atom. This special fission-made iodine gives off powerful gamma rays, like radium does. It can therefore destroy human tissue if it can get at it. Since it is attracted to thyroid tissue, it can be used to destroy it, whether or not it is diseased. Separate out this particular kind of iodine from all the many products of uranium fission as the Atomic Energy Commission does at Oak Ridge, Tenn., feed it to the patient and the radioiodine will go to the thyroid and do its work. Fortunately, this kind of radioiodine is relatively short-lived, half of it losing its activity in eight days. So it is relatively safe to use, since it will not go on with its lethal bombardments when they are no longer needed.

For treating over-active thyroid glands, a condition known as toxic goiter, radioiodine has been very successful. The Mayo Clinic reports success in 80% of the cases treated. Radioiodine also helps to diagnose the disordered thyroid, whether it is overactive, underactive or cancerous. It is also used as a tracer to locate the deposits of thyroid cancer tissue in various parts of the body far removed from the parent growth —metastases they are called.

The results of treatment of thyroid cancer with radioiodine have not been nearly as satisfying as the treatment of toxic goiter. The latest report of the Atomic Energy Commission explains that malignant thyroid tissue often does not pick up as much of the radioactive iodine as does the normal thyroid tissue. Much research is underway, some of it very promising, particularly attempts to put the radioiodine in organic compounds that will be selectively absorbed by cancerous tissues.

At the Sloan-Kettering Institute for Cancer Research in New York, animal experiments are testing whether natural antibodies can be made to carry radioiodine to special parts of the body, such as the liver and kidney, there to administer strong doses of radioactivity.

The metal cobalt when irradiated in the Oak Ridge pile emits radiations similar to those of radium. Since it can be made inexpensively and fabricated into special applicators, it will come into general use for cancer treatment when handling and dosage are worked out.

The radioactive form of phosphorus is being used to treat leukemia, a cancerous condition of an excess of white corpuscles in the blood, and results are as effective as X-ray therapy without causing uncomfortable radiation sickness. This use is based upon the fact that phosphorus concentrates in the blood-producing centers.

Treatment of cancer by radioisotopes is still in its early stages. Much more must be learned about basic bodily processes generally, and specifically what molecules concentrate in diseased body tissues and can therefore carry to them the exploding atoms that can blast out the disease.

Science has had ample supplies of radioisotopes for only a short time as scientific progress goes. The first shipment of a radioisotope was made from Oak Ridge just two years ago (Aug. 2) and it was radiocarbon 14, a substance that Massachusetts General Hospital research hints may be absorbed rapidly by diseased tissue when it is incorporated in protein compounds.

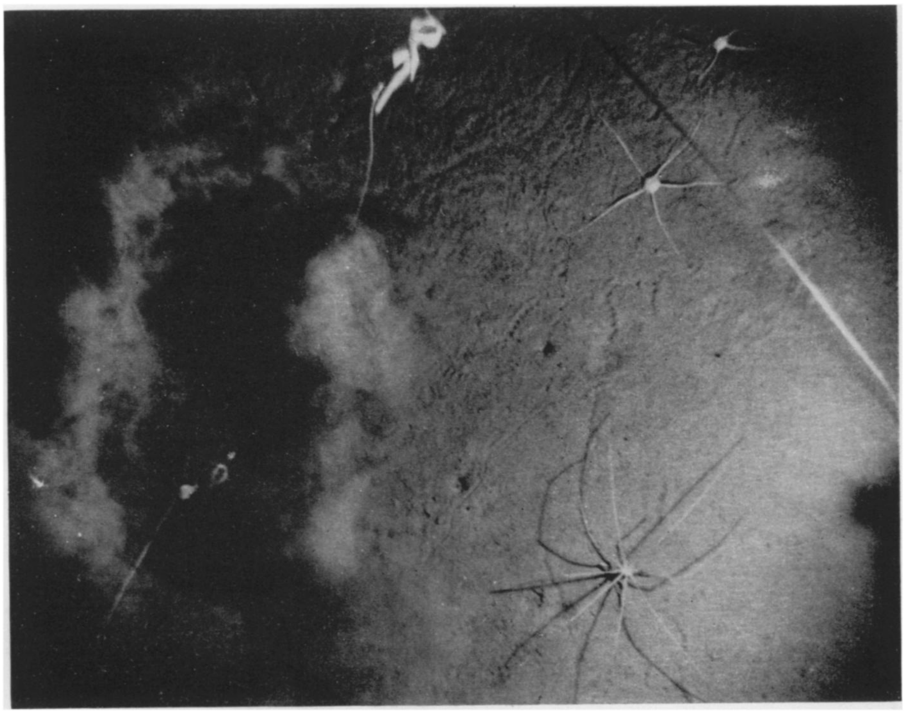
Science News Letter, August 14, 1948

PHOTOGRAPHY

Photographs of Sea-Life Taken at 3.5 Mile Depth

See Front Cover

➤ "LOWEST-DOWN" of all photographs thus far taken in the sea is one just brought back from the North Atlantic by the Woods Hole Oceanographic Institution research vessel *Atlantis.*



6,000 FEET UNDER THE ATLANTIC—The sea spider, about 28 inches across, and a few brittle stars were snapped by an underwater camera some 100 miles south of Cape Cod. The cloud is caused by the arrival on the bottom of the fishline which was attached to the camera.

Taken with a special pressure-resistant camera and brilliant flash bulbs at three and one-half miles' depth, the picture on the cover of this week's SCIENCE NEWS LETTER shows on the bottom a colony of roughly elliptical objects believed to be sponges.

Another picture, taken at the relatively shallow depth of 6,000 feet (not much more than a mile) shows several brittle-stars and a sea-spider.

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Letters To The Editor

Big Sister Unhappy

You said in an article about soap operas (SNL, July 3) that "Big Sister is happily married." I happen to listen to that program and I know that Big Sister is very unhappily married on the program and isn't living with her husband.—Miss S. Richman, New York City.

When the study was made in 1945-1946 Big Sister was happily married. The findings made at that time still hold true for Big Sister inspires her listeners by her unselfishness and wisdom in dealing with others.

Boring Into Wood

I saw leaf-cutter bees this year at my brother-in-law's farm in Devon, Kansas. They look like you say they do (SNL, July 24), but instead of eating on the roses they bore holes in the wood. He is after them all the time as they are destroying the wood in the barn and house.

He told me there was a barn near him that is almost eaten up by these bees and they have cutters in front of them just as you said. They do look like bumble-bees only slimmer.—Mrs. Harry Glick, Dawn, Mo.

Your observation on the habits of the leaf-cutter bee is correct: the insect does dig holes in wood. These are to be its home: it lines them afterwards with the cuttings it makes from the leaves of roses and other plants.

For protection, here are two suggestions: (1) Paint. The leaf-cutter won't go through a covering of paint to get at wood. They always do their work in unpainted wood. (2) If painting is not practicable, apply a strong solution of DDT, residual-type, using either whitewash-brush or spray-gun.

Not Poisonous

In an article headed "Poison Gas in Atmosphere" (SNL, July 3) the text indicates that methane is described as a poison gas. My personal experience with methane, and the available literature regarding toxicity of methane toward human beings, indicates that methane can not be described as a poison gas.—Thomas S. Bacon, Dallas, Texas.

Thanks. In a strict sense methane is not a poisonous gas. Authorities inform us that although suffocation could be caused if sufficient methane were in an occupied space, experiments in which methane and oxygen were mixed in proportion of 80% methane and 20% oxygen demonstrated that animals could live unharmed in such an atmosphere.

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PHYSICS

Ultrasonic Sound Waves Detect Flaws in Metals

➤ HIGH-FREQUENCY sound waves, far too high for the human ear to hear, are being used by General Electric to discover and record small flaws in metals.

A new device, developed to permit the use of these waves called ultrasonic by scientists, shoots 1,000,000 cycle-per-second sound waves through the metals to be tested, and simultaneously plots a graph which shows any flaws in the metal's interior. Testing is carried out by immersing the metal specimen in oil, because these sound waves will not travel through air.

A small sound-wave transmitter, wired to the main body of the instrument and also immersed in the oil, sends the waves through the oil and through the metal sample. Waves are interrupted by a crack or other flaw in the metal, and the flaw is indicated on the graph. The transmitter is a small crystal which is made to vibrate and produce sound waves by an electric current. The receiver has a similar crystal.

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Question Box

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